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Paul F-Brandwein Lecture

The Identification and Development of Giftedness as a Paradigm for School Reform[1,2]

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Based on ideas advocated by Paul F-Brandwein's *The Gifted Student as Future Scientist,* this article summarizes theories of intelligence leading to his theory of the three-ring conception of giftedness and how that theory led to the development of the Schoolwide Enrichment Model. The Schoolwide Enrichment Model provides a detailed model for total school improvement that can be customized based on the local resources, student population, school leadership dynamics, and faculty strengths and creativity of each particular school. The model consists of three service delivery components: The Total Talent Portfolio, Curriculum Modification Techniques, and Enrichment Learning and Teaching, which are brought to bear on three school structures: The Regular Curriculum, Enrichment Clusters, and the Continuum of Special Services. Implementation of this model provides an organizational framework for schools to become places for talent development.

When you go to the well to draw some
water, take a moment to say a prayer for the
person who dug the well.
—Chinese Proverb

INTRODUCTION

I am deeply honored to present the Paul F-Brandwein Lecture at the 1999 National Science Teachers Association convention. Paul was both a mentor and a friend, and I can say without reservation that reading his book, *The Gifted Student as Future Scientist* (Brandwein, 1955), was

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[2] Reflecting on the wisdom and vision of Paul F-Brandwein—scientist, author, artist, master teacher, and humanitarian—the Paul F-Brandwein Lecture recognizes leaders in education who identify human interdependence with nature and human responsibility for maintaining a sanative environment. The lecture is presented annually at the National Science Teachers Association National Convention. The lecture is endowed through the Paul F-Brandwein Institute, Inc., Greenville, New York.

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a turning point in both the way I viewed giftedness and the related models I have created to promote the development of gifted behaviors in young people. For me, and for many, many other theorists, researchers, and practitioners, Paul's work set the agenda for a more flexible way of looking at the entire concept of giftedness, and for examining a more student-centered approach to developing the gifts and talents of young scientists as well as persons involved in other areas of human productivity. Paul F-Brandwein dug the well from which I and many others have drawn our ideas, inspiration, and wisdom. And so today, I dedicate this lecture to Paul, and also to Mary Brandwein, who was Paul's life-long partner. Mary helped initiate and today continues the important environmental work Paul envisioned as mankind's responsibility for the preservation and protection of the earth's resources. Finally, I am proud to say that our organization, The National Research Center on the Gifted and Talented at the University of Connecticut, has the distinct honor of being the publisher of Paul's final book, *Science Talent in the Young Expressed Within Ecologies of Achievement* (Brandwein, 1995).

This article will deal with two general concepts, both of which are based on ideas advocated by Paul F-Brandwein during his long career as a leader in both gifted education and science education. In Part I, I will describe a conception of giftedness that represents a departure from the rigid and very restricted view about "the gifted" that was popular prior to the advent of Brandwein's (1955) work. In Part II, a plan for developing the gifts and talents of all students will be presented. This plan, entitled the Schoolwide Enrichment Model, is designed to capitalize upon the conception of giftedness presented in Part I, and an effort is made to show how the plan represents an organized and high-end learning approach to concerns about total school improvement.

PART I: THE THREE-RING CONCEPTION OF GIFTEDNESS

The age-old issue of "what makes giftedness" has been debated by scholars, educational practitioners, and lay persons for decades. This section will attempt to shed some light on this complex and controversial question by describing a broad range of theoretical issues and research studies that have been associated with the study of gifted and talented persons.

One of the first and most important issues that should be dealt with in a search for the meaning of giftedness is that there must be a purpose for defining this concept. The goals of science tell us that a primary purpose is to add new knowledge to our understanding about human conditions, but in an applied field of knowledge there is also a practical purpose for defining concepts. In view of the practical purposes for which a definition might be used, it is necessary to consider any definition in the larger context of overall programming for the target population we are attempting to serve. In other words, the way in which one views giftedness will be a primary factor in both constructing a plan for identification and in providing services that are relevant to the characteristics that brought certain youngsters to our attention in the first place. If, for example, one identifies giftedness as extremely high mathematical aptitude, then it would seem nothing short of common sense to use assessment procedures that readily identify potential for superior performance in this particular area of ability. And it would be equally reasonable to assume that a program based on this definition and identification procedure should devote major emphasis to the enhancement of performance in mathematics and related areas. Similarly, a definition that emphasizes artistic abilities should point the way toward relatively specific identification and programming practices. As long as there are differences of opinion

among reasonable scholars there will never be a single definition of giftedness, and this is probably the way it should be. But one requirement for which all writers of definitions should be accountable is the necessity of showing a logical relationship between definition on the one hand and recommended identification and programming practices on the other.

Two Kinds of Giftedness

A second issue that must be dealt with is that our present efforts to define giftedness are based on a long history of previous studies dealing with human abilities. Most of these studies focused mainly on the concept of intelligence and are briefly discussed here to establish an important point about the process of defining concepts rather than any attempt to equate intelligence with giftedness. Although a detailed review of these studies is beyond the scope of the present article, a few of the general conclusions from earlier research are necessary to set the stage for this analysis.

The first conclusion is that intelligence is not a unitary concept. Rather, there are many kinds of intelligence, and therefore single definitions cannot be used to explain this complicated concept. The confusion and inconclusiveness about present theories of intelligence has led Sternberg (1984) and others to develop new models for explaining this complicated concept. Sternberg's "triarchic" theory of human intelligence consists of three subtheories: a contextual subtheory, which relates intelligence to the external world of the individual; a two-facet subtheory, which relates intelligence to both the external and internal worlds of the individual; and a componential subtheory, which relates intelligence to the internal world of the individual. Gardner's (1983) theory of multiple intelligences proposes the following eight types of intellectual behavior: Linguistic, Logical–Mathematical, Spatial, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal, and Naturalistic.

In view of this recent work and numerous earlier cautions about the dangers of trying to describe intelligence through the use of single scores, it seems safe to conclude that this practice has been and always will be questionable. At the very least, attributes of intelligent behavior must be considered within the context of cultural and situational factors. Indeed, some of the most recent examinations have concluded that "[t]he concept of intelligence *cannot* be explicitly defined, not only because of the nature of intelligence but also because of the nature of concepts" (Neisser, 1979, p. 179).

A second conclusion is that there is no ideal way to measure intelligence and therefore we must avoid the typical practice of believing that if we know a person's IQ score, we also know his or her intelligence. Even Terman warned against total reliance on tests: "We must guard against defining intelligence, solely in terms of ability to pass the tests of a given intelligence scale" (Thorndike, 1921, p. 131). Thorndike echoed Terman's concern by stating "to assume that we have measured some general power which resides in [the person being tested] and determines his ability in every variety of intellectual task in its entirety is to fly directly in the face of all that is known about the organization of the intellect" (Thorndike, 1921, p. 126).

The reason I have cited these concerns about the historical difficulty of defining and measuring intelligence is to highlight the even larger problem of isolating a unitary definition of giftedness. At the very least we will always have several conceptions (and therefore definitions)

of giftedness; but it will help in this analysis to begin by examining two broad categories that have been dealt with in the research literature. I will refer to the first category as "schoolhouse giftedness" and to the second as "creative-productive giftedness." Before going on to describe each type, I want to emphasize that:

1. Both types are important.
2. There is usually an interaction between the two types.
3. Special programs should make appropriate provisions for encouraging both types of giftedness as well as the numerous occasions when the two types interact with each other.

Schoolhouse Giftedness

Schoolhouse giftedness might also be called test-taking or lesson-learning giftedness. It is the kind most easily measured by IQ or other cognitive ability tests, and for this reason it is also the type most often used for selecting students for entrance into special programs. The abilities people display on IQ and aptitude tests are exactly the kinds of abilities most valued in traditional school learning situations. In other words, the games people play on ability tests are similar in nature to games that teachers require in most lesson-learning situations. Research tells us that students who score high on IQ tests are also likely to get high grades in school. Research also has shown that these test-taking and lesson-learning abilities generally remain stable over time. The results of this research should lead us to some very obvious conclusions about schoolhouse giftedness: It exists in varying degrees; it can be identified through standardized assessment techniques; and we should therefore do everything in our power to make appropriate modifications for students who have the ability to cover regular curricular material at advanced rates and levels of understanding. Curriculum compacting (Renzulli, Smith, & Reis, 1982), a procedure used for modifying curricular content to accommodate advanced learners, and other acceleration techniques should represent an essential part of any school program that strives to respect the individual differences that are clearly evident from scores yielded by cognitive ability tests.

Creative-Productive Giftedness

If scores on IQ tests and other measures of cognitive ability only account for a limited proportion of the common variance with school grades, we can be equally certain that these measures do not tell the whole story when it comes to making predictions about creative-productive giftedness. Before defending this assertion with some research findings, let us briefly review what is meant by this second type of giftedness, the important role that it should play in programming, and, therefore, the reasons we should attempt to assess it in our identification procedures—even if such assessment causes us to look below the top 3–5% on the normal curve of IQ scores.

Creative-productive giftedness describes those aspects of human activity and involvement where a premium is placed on the development of original material and products that are purposefully designed to have an impact on one or more target audiences. Learning situations that are designed to promote creative-productive giftedness emphasize the use and application of information (content) and thinking processes in an integrated, inductive, and real-

problem–oriented manner. The role of the student is transformed from that of a learner of prescribed lessons to one in which she or he uses the modus operandi of a firsthand inquirer. This approach is quite different from the development of lesson-learning giftedness that tends to emphasize deductive learning, structured training in the development of thinking processes, and the acquisition, storage, and retrieval of information. In other words, creative-productive giftedness is simply putting one's abilities to work on problems and areas of study that have personal relevance to the student and that can be escalated to appropriately challenging levels of investigative activity. The roles that both students and teachers should play in the pursuit of these problems have been described elsewhere (Renzulli, 1982, 1983).

Why is creative-productive giftedness important enough for us to question the "tidy" and relatively easy approach that traditionally has been used to select students on the basis of test scores? Why do some people want to rock the boat by challenging a conception of giftedness that can be numerically defined by simply giving a test? The answers to these questions are simple and yet very compelling. The research reviewed later in this article tells us that there is much more to the making of a gifted person than the abilities revealed on traditional tests of intelligence, aptitude, and achievement. Furthermore, history tells us it has been the creative and productive people of the world, the producers rather than consumers of knowledge, the reconstructionists of thought in all areas of human endeavor, who have become recognized as "truly gifted" individuals. History does not remember persons who merely scored well on IQ tests or those who learned their lessons well.

The Gifted and the Potentially Gifted

A further issue relates to the subtle but very important distinction that exists between the "gifted" and the "potentially gifted." Most of the research reviewed below deals with student and adult populations whose members have been judged (by one or more criteria) to be gifted. In most cases, researchers have studied those who have been identified as "being gifted" much more intensively than they have studied persons who were not recognized or selected because of unusual accomplishments. The general approach to the study of gifted persons could easily lead the casual reader to believe that giftedness is a condition that is magically bestowed on a person in much the same way that nature endows us with blue eyes, red hair, or a dark complexion. This position is *not* supported by the research. Rather, what the research clearly and unequivocally tells us is that *giftedness can be developed* in some people if an appropriate interaction takes place between a person, his or her environment, and a particular area of human endeavor.

It should be kept in mind that when I describe, in the paragraphs that follow, a certain trait as being a component of giftedness (e.g., creativity), I am in no way assuming that one is "born with" this trait, even if one happens to possess a high IQ. Almost all human abilities can be developed, and therefore my intent is to call attention to the potentially gifted (that is to say, those who could "make it" under the right conditions) as well as to those who have been studied because they gained some type of recognition. Implicit in this concept of the potentially gifted, then, is the idea that giftedness emerges or "comes out" at different times and under different circumstances. Without such an approach there would be no hope whatsoever of identifying bright underachievers, students from disadvantaged backgrounds, or any other special population that is not easily identified through traditional testing procedures.

Are People "Gifted" or Do They Display Gifted Behaviors?

A fifth and final issue underlying the search for a definition of giftedness is more nearly a bias and a hope for at least one major change in the ways we view this area of study. Except for certain functional purposes related mainly to professional focal points (i.e., research, training, legislation) and for ease of expression, believe that a term such as *the gifted* is counterproductive to educational efforts aimed at identification and programming for certain students in the general school population. Rather, it is my hope that in years ahead we will shift our emphasis from the present concept of "being gifted" (or not being gifted) to a concern about developing *gifted behaviors* in those youngsters who have the highest potential for benefiting from special education services. This slight shift in terminology might appear to be an exercise in heuristic hairsplitting, but I believe that it has significant implications for the entire way we think about the concept of giftedness and the ways in which we structure the field for important research endeavors[4] and effective educational programming.

For too many years we have pretended that we can identify gifted children in an absolute and unequivocal fashion. Many people have been led to believe that certain individuals have been endowed with a golden chromosome that makes them "gifted persons." This belief has further led to the mistaken idea that all we need to do is find the right combination of factors that prove the existence of this chromosome. The further use of such terms as the "truly gifted," the "moderately gifted," and the "borderline gifted" only serve to confound the issue and might result in further misguided searches for silver and bronze chromosomes. This misuse of the concept of giftedness has given rise to a great deal of confusion and controversy about both identification and programming, and the result has been needless squabbling among professionals in the field. Another result has been that so many mixed messages have been sent to educators and the public at large that both groups now have a justifiable skepticism about the credibility of the gifted education establishment and our ability to offer services that are qualitatively different from general education.

The alternative to such an absolutist view is that we may have to forgo the "tidy" and comfortable tradition of "knowing" on the first day of school who is gifted and who is not gifted. Rather, our orientation must be redirected toward developing "gifted behaviors" in certain students (not all students), at certain times (not all the time), and under certain circumstances. The tradeoff for tidiness and administrative expediency will result in a much more flexible approach to both identification and programming as well as a system that not only shows a greater respect for the research on gifted and talented people but is both fairer and more acceptable to other educators and to the general public.

Research Underlying the Three-Ring Conception of Giftedness

One way of analyzing the research underlying conceptions of giftedness is to review existing definitions along a continuum ranging from conservative to liberal. *Conservative* and

[4] For example, most of the research on the "gifted" that has been carried out to date has used high-IQ populations. If one disagrees (even slightly) with the notion that giftedness and high IQ are synonymous, then these research studies must be reexamined. These studies may tell us a great deal about the characteristics, and so on, of high-IQ individuals, but are they necessarily studies of the gifted?

liberal are used here not in their political connotations, but rather according to the degree of restrictiveness that is used in determining who is eligible for special programs and services.

Restrictiveness can be expressed in two ways. First, a definition can limit the number of specific performance areas that are considered in determining eligibility for special programs. A conservative definition, for example, might limit eligibility to academic performance only and exclude other areas such as music, art, drama, leadership, public speaking, social service, and creative writing. Second, a definition can limit the degree or level of excellence that one must attain by establishing extremely high cutoff points.

At the conservative end of the continuum is Terman's (1926) definition of giftedness as "the top 1 percent level in general intellectual ability as measured by the Stanford-Binet Intelligence Scale or a comparable instrument" (1926, p. 43). In this definition, restrictiveness is present in terms of both the type of performance specified (i.e., how well one scores on an intelligence test) and the level of performance one must attain to be considered gifted (top 1%). At the other end of the continuum can be found more liberal definitions, such as the following one by Witty (1958):

> There are children whose outstanding potentialities in art, in writing, or in social leadership can be recognized largely by their performance. Hence, we have recommended that the definition of giftedness be expanded and that we consider any child gifted whose performance, in a potentially valuable line of human activity, is consistently remarkable. (p. 62)

Although liberal definitions have the obvious advantage of expanding the conception of giftedness, they also open up two "cans of worms" by introducing a values issue (What are the potentially valuable lines of human activity?) and the age-old problem of subjectivity in measurement.

In recent years, the values issue has been largely resolved. There are very few educators who cling tenaciously to a "straight IQ" or purely academic definition of giftedness. "Multiple talent" and "multiple criteria" are almost the bywords of the present-day gifted student movement, and most persons would have little difficulty in accepting a definition that includes almost every area of human activity that manifests itself in a socially useful form of expression.

The problem of subjectivity in measurement is not as easily resolved. As the definition of giftedness is extended beyond those abilities that are clearly reflected in tests of intelligence, achievement, and academic aptitude, it becomes necessary to put less emphasis on precise estimates of performance and potential and more emphasis on the opinions of qualified human judges in making decisions about admission to special programs. The crux of the issue boils down to a simple and yet very important question: How much of a trade-off are we willing to make on the objective-subjective continuum in order to allow recognition of a broader spectrum of human abilities? If some degree of subjectivity cannot be tolerated, then our definition of giftedness and the resulting programs will logically be limited to abilities that can be measured only by objective tests.

The Three-Ring Conception of Giftedness

Research on creative-productive people has consistently shown that although no single criterion can be used to determine giftedness, persons who have achieved recognition because of their unique accomplishments and creative contributions possess a relatively well-defined set of three interlocking clusters of traits. These clusters consist of above-average, though not necessarily superior, ability, task commitment, and creativity (Figure 1). It is important to point out that no single cluster "makes giftedness." Rather, it is the interaction among the three clusters that research has shown to be the necessary ingredient for creative-productive accomplishment (Renzulli, 1978). This interaction is represented by the shaded portion of Figure 1. It is also important to point out that each cluster plays an important role in contributing to the display of gifted behaviors. This point is emphasized because one of the major errors that continues to be made in identification procedures is to overemphasize superior abilities at the expense of the other two clusters of traits.

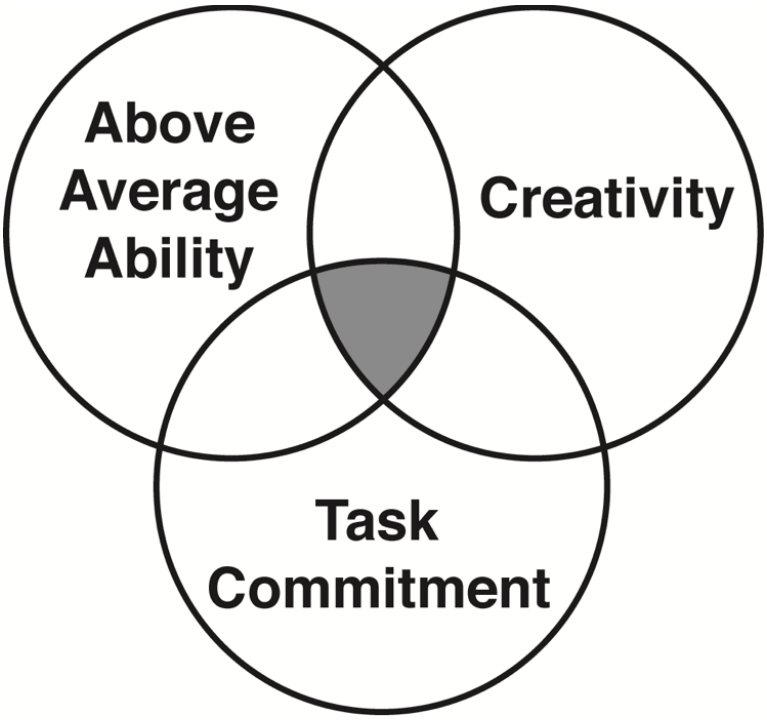

Figure 1. The three ring conception of giftedness.

Well-Above-Average Ability

Well above average ability can be defined in two ways. *General ability* consists of the capacity to process information, to integrate experiences that result in appropriate and adaptive responses in new situations, and the capacity to engage in abstract thinking. Examples of general ability are verbal and numerical reasoning, spatial relations, memory, and word fluency. These abilities are usually measured by tests of general aptitude or intelligence, and are broadly applicable to a variety of traditional learning situations.

Specific abilities consist of the capacity to acquire knowledge, skill, or the ability to perform in one or more activities of a specialized kind and within a restricted range. These abilities are defined in a manner that represents the ways in which human beings express themselves in real-life (i.e., nontest) situations. Examples of specific abilities are chemistry, ballet, mathematics, musical composition, sculpture, and photography. Each specific ability can be further subdivided into even more specific areas (e.g., portrait photography, astrophotography, photojournalism, etc.). Specific abilities in certain areas such as mathematics and chemistry have a strong relationship with general ability and, therefore, some indication of potential in these areas can be determined from tests of general aptitude and intelligence. They can also be measured by achievement tests and tests of specific aptitude. Many specific abilities, however, cannot be easily measured by tests, and, therefore, areas such as the arts must be evaluated through one or more performance-based assessment techniques.

Within this model the term *above-average ability* will be used to describe both general and specific abilities. *Above average* should also be interpreted to mean the upper range of potential within any given area. Although it is difficult to assign numerical values to many specific areas of ability, when I refer to "well above average ability" I clearly have in mind persons who are capable of performance or the potential for performance that is representative of the top 15–20% of any given area of human endeavor.

Although the influence of intelligence, as traditionally measured, quite obviously varies with specific areas of performance, many researchers have found that creative accomplishment is not necessarily a function of measured intelligence. In a review of several research studies dealing with the relationship between academic aptitude tests and professional achievement, Wallach (1976, p. 57) has concluded that: "Above intermediate score levels, academic skills assessments are found to show so little criterion validity as to be a questionable basis on which to make consequential decisions about students' futures. What the academic tests do predict are the results a person will obtain on other tests of the same kind."

Wallach goes on to point out that academic test scores at the upper ranges—precisely the score levels that are most often used for selecting persons for entrance into special programs—do not necessarily reflect the potential for creative-productive accomplishment. Wallach suggests that test scores be used to screen out persons who score in the lower ranges and that beyond this point decisions should be based on other indicators of potential for superior performance.

Numerous research studies support Wallach's findings that there is a limited relationship between test scores and school grades on the one hand and real-world accomplishments on the other (Bloom, 1963; Harmon, 1963; Helson & Crutchfield, 1970; Hudson, 1960; Mednick, 1963; Parloff et al., 1968; Richards, Holland, & Lutz, 1967; Wallach & Wing, 1969). In fact, in a study dealing with the prediction of various dimensions of achievement among college students, Holland and Astin (1962) found that "getting good grades in college has little connection with more remote and more socially relevant kinds of achievement; indeed, in some colleges, the higher the student's grades, the less likely it is that he is a person with creative potential. So it seems desirable to extend our criteria of talented performance" (pp. 132–133). A study by the American College Testing Program (Munday & Davis, 1974) entitled, "Varieties of Accomplishment After College: Perspectives on the Meaning of Academic Talent," concluded that

> . . . the adult accomplishments were found to be uncorrelated with academic talent, including test scores, high school grades, and college grades. However, the adult accomplishments were related to comparable high school nonacademic (extra curricular) accomplishments. This suggests that there are many kinds of talents related to later success which might be identified and nurtured by educational institutions. (p. 2)

The pervasiveness of this general finding is demonstrated by Hoyt (1965), who reviewed 46 studies dealing with the relationship between traditional indications of academic success and postcollege performance in the fields of business, teaching, engineering, medicine, scientific research, and other areas such as the ministry, journalism, government, and miscellaneous professions. From this extensive review, Hoyt concluded that traditional indications of academic success have no more than a very modest correlation with various indicators of success in the adult world and that "There is good reason to believe that academic achievement (knowledge) and other types of educational growth and development are relatively independent of each other" (p. 73).

The experimental studies conducted by Sternberg (1981) and Sternberg and Davidson (1982) have added a new dimension to our understanding about the role that intelligence tests should play in making identification decisions. After numerous investigations into the relationship between traditionally measured intelligence and other factors such as problem solving and insightful solutions to complex problems, Sternberg (1982) concludes that:

> . . . tests only work for some of the people some of the time—not for all of the people all of the time—and that some of the assumptions we make in our use of tests are, at best, correct only for a segment of the tested population, and at worst, correct for none of it. As a result we fail to identify many gifted individuals for whom the assumptions underlying our use of tests are particularly inadequate. The problem, then, is not only that tests are of limited validity for everyone but that their validity varies across individuals. For some people, tests scores may be quite informative, for others such scores may be worse than useless. Use of test score cutoffs and formulas results in a serious problem of underidentification of gifted children. (p. 157)

The studies raise some basic questions about the use of tests as a major criterion for making selection decisions. The research reported above clearly indicates that vast numbers *and* proportions of our most productive persons are *not* those who scored at the 95th percentile or above on standardized tests of intelligence, nor were they necessarily straight A students who discovered early how to play the lesson-learning game. In other words, more creative-productive persons came from below the 95th percentile than above it and, if such cutoff scores are needed to determine entrance into special programs, we may be guilty of actually discriminating against persons who have the greatest potential for high levels of accomplishment.

The most defensible conclusion about the use of intelligence tests that can be put forward at this time is based on research findings dealing with the "threshold effect." Reviews by Chambers (1969) and Stein (1968) and research by Walberg (1969, 1971) indicate that accomplishments in various fields require minimal levels of intelligence, but that beyond these levels, degrees of attainment are weakly associated with intelligence. In studies of creativity it is generally acknowledged that a fairly high although not exceptional, level of intelligence is

necessary for high degrees of creative achievement (Barron, 1969; Campbell, 1960; Guilford, 1964, 1967; McNemar, 1964; Vernon, 1967).

Research on the threshold effect indicates that different fields and subject matter areas require varying degrees of intelligence for high-level accomplishment. In mathematics and physics, the correlation of measured intelligence with originality in problem solving tends to be positive but quite low. Correlations between intelligence and the rated quality of work by painters, sculptors, and designers is zero or slightly negative (Barron, 1968). Although it is difficult to determine exactly how much measured intelligence is necessary for high levels of creative and productive accomplishment within any given field, there is a consensus among many researchers (Barron, 1969; Bloom, 1963; Cox, 1926; Harmon, 1963; Helson & Crutchfield, 1970; MacKinnon, 1962, 1965; Oden, 1968; Roe, 1953; Terman, 1954) that once the IQ is 120 or higher other variables become increasingly important. These variables are discussed in the paragraphs that follow.

Task Commitment

A second cluster of traits that consistently has been found in creative-productive persons is a refined or focused form of motivation known as task commitment. Whereas motivation is usually defined in terms of a general energizing process that triggers responses in organisms, task commitment represents energy brought to bear on a particular problem (task) or specific performance area. The terms that are most frequently used to describe task commitment are perseverance, endurance, hard work, dedicated practice, self-confidence, and a belief in one's ability to carry out important work. In addition to perceptiveness (Albert, 1975) and a better sense for identifying significant problems (Zuckerman, 1979), research on persons of unusual accomplishment has consistently shown that a special fascination for and involvement with the subject matter of one's chosen field "are the almost invariable precursors of original and distinctive work" (Barron, 1969, p. 3). Even in young people whom Bloom and Sosniak (1981) identified as extreme cases of talent development, early evidence of task commitment was present. Bloom and Sosniak report that "after age 12 our talented individuals spent as much time on their talent field each week as their average peer spent watching television" (p. 94). The argument for including this nonintellective cluster of traits in a definition of giftedness is nothing short of overwhelming. From popular maxims and autobiographical accounts to hard-core research findings, one of the key ingredients that has characterized the work of gifted persons is their ability to involve themselves totally in a specific problem or area for an extended period of time.

The legacy of both Sir Francis Galton and Lewis Terman clearly indicates that task commitment is an important part of the making of a gifted person. Although Galton was a strong proponent of the hereditary basis for what he called "natural ability," he nevertheless subscribed heavily to the belief that hard work was part and parcel of giftedness:

> By natural ability, I mean those qualities of intellect and disposition, which urge and qualify a man to perform acts that lead to reputation. I do not mean capacity without zeal, nor zeal without capacity, nor even a combination of both of them, without an adequate power of doing a great deal of very laborious work. But I mean a nature which, when left to itself, will, urged by an inherent stimulus, climb the path that leads to eminence and

> has strength to reach the summit—on which, if hindered or thwarted, will fret and strive until the hindrance is overcome, and it is again free to follow its laboring instinct. (Galton, 1869, p. 33, as quoted in Albert, 1975, p. 142)

The monumental studies of Lewis Terman undoubtedly represent the most widely recognized and frequently quoted research on the characteristics of gifted persons. Terman's studies, however, have unintentionally left a mixed legacy because most persons have dwelt (and continue to dwell) on "early Terman" rather than the conclusions he reached *after* several decades of intensive research. As such, it is important to consider the following conclusion that he reached as a result of 30 years of follow-up studies on his initial population:

> A detailed analysis was made of the 150 most successful and 150 least successful men among the gifted subjects in an attempt to identify some of the non-intellectual factors that affect life success. . . . Since the less successful subjects do not differ to any extent in intelligence as measured by tests, it is clear that notable achievement calls for more than a high order of intelligence. The results [of the follow-up] indicated that personality factors are extremely important determiners of achievement. . . . The four traits on which [the most and least successful groups] differed most widely were *persistence in the accomplishment of ends, integration toward goals, self-confidence, and freedom from inferiority feelings*. In the total picture the greatest contrast between the two groups was in all-round emotional and social adjustment, and in *drive to achieve*. (Terman & Oden, 1959, p. 148; italics added)

Although Terman never suggested that task commitment should replace intelligence in our conception of giftedness, he did state that "intellect and achievement are far from perfectly correlated."

Several more recent research studies support the findings of Galton and Terman and have shown that creative-productive persons are far more task oriented and involved in their work than are people in the general population. Perhaps the best known of these studies is the work of Roe (1953) and MacKinnon (1964, 1965). Roe conducted an intensive study of the characteristics of 64 eminent scientists and found that *all* of her subjects had a high level of commitment to their work. MacKinnon pointed out traits that were important in creative accomplishments: "It is clear that creative architects more often stress their inventiveness, independence and individuality, their *enthusiasm, determination,* and *industry*" (1964, p. 365; italics added).

Extensive reviews of research carried out by Nicholls (1972) and McCurdy (1960) found patterns of characteristics that were consistently similar to the findings reported by Roe and MacKinnon. Although the studies cited thus far used different research procedures and dealt with a variety of populations, there is a striking similarity in their major conclusions. First, academic ability (as traditionally measured by tests or grade point averages) showed limited relationships to creative-productive accomplishment. Second, nonintellectual factors, and especially those related to task commitment, consistently played an important part in the traits that characterized highly productive people. Although this second cluster of traits is not as easily and objectively identifiable as general cognitive abilities are, these traits are nevertheless a major component of giftedness and should, therefore, be reflected in our definition.

Creativity

The third cluster of traits that characterizes gifted persons consists of factors usually lumped together under the general heading of "creativity." As one reviews the literature in this area, it becomes readily apparent that the words *gifted, genius,* and *eminent creators* or *highly creative persons* are used synonymously. In many of the research projects discussed above, the persons ultimately selected for intensive study were in fact recognized because of their creative accomplishments. In MacKinnon's (1964) study, for example, panels of qualified judges (professors of architecture and editors of major American architectural journals) were asked first to nominate and later to rate an initial pool of nominees, using the following dimensions of creativity:

1. Originality of thinking and freshness of approaches to architectural problems.
2. Constructive ingenuity.
3. Ability to set aside established conventions and procedures when appropriate.
4. A flair for devising effective and original fulfillments of the major demands of architecture, namely, technology (firmness), visual form (delight), planning (commodity), and human awareness and social purpose (p. 360).

When discussing creativity, it is important to consider the problems researchers have encountered in establishing relationships between creativity tests and other more substantial accomplishments. A major issue that has been raised by several investigators deals with whether or not tests of divergent thinking actually measure "true" creativity. Although some validation studies have reported limited relationships between measures of divergent thinking and creative performance criteria (Dellas & Gaier, 1970; Guilford, 1967; Shapiro, 1968; Torrance, 1969) the research evidence for the predictive validity of such tests has been limited. Unfortunately, very few tests have been validated against real-life criteria of creative accomplishment; however, future longitudinal studies using these relatively new instruments might show promise of establishing higher levels of predictive validity. Thus, although divergent thinking is indeed a characteristic of highly creative persons, caution should be exercised in the use and interpretation of tests designed to measure this capacity.

Given the inherent limitations of creativity tests, a number of writers have focused attention on alternative methods for assessing creativity. Among others, Nicholls (1972) suggests that an analysis of creative products is preferable to the trait-based approach in making predictions about creative potential (p. 721), and Wallach (1976) proposes that student self-reports about creative accomplishment are sufficiently accurate to provide a usable source of data.

Although few persons would argue against the importance of including creativity in a definition of giftedness, the conclusions and recommendations discussed above raise the haunting issue of subjectivity in measurement. In view of what the research suggests about the questionable value of more objective measures of divergent thinking, perhaps the time has come for persons in all areas of endeavor to develop more careful procedures for evaluating the products of candidates for special programs.

Discussion and Generalization

The studies reviewed in the preceding sections lend support to a small number of basic generalizations that can be used to develop an operational definition of giftedness. The first of these generalizations is that giftedness consists of an interaction among three clusters of traits: above-average but not necessarily superior general abilities, task commitment, and creativity. Any definition or set of identification procedures that does not give equal attention to all three clusters is simply ignoring the results of the best available research dealing with this topic.

Related to this generalization is the need to make a distinction between traditional indicators of academic proficiency and creative productivity. A sad but true fact is that special programs have favored proficient lesson learners and test takers at the expense of persons who may score somewhat lower on tests but who more than compensate for such scores by having high levels of task commitment and creativity. It is these persons whom research has shown to be those who ultimately make the most creative-productive contributions to their respective fields of endeavor.

A second generalization is that an operational definition should be applicable to all socially useful performance areas. The one thing that the three clusters discussed above have in common is that each can be brought to bear on a multitude of specific performance areas. As was indicated earlier, the interaction or overlap among the clusters "makes giftedness," but giftedness does not exist in a vacuum. Our definition must, therefore, reflect yet another interaction, but in this case it is the interaction between the overlap of the clusters and any performance area to which the overlap might be applied. This interaction is represented by the large arrow in Figure 2.

A third and final generalization concerns the types of information that should be used to identify superior performance in specific areas. Although it is a relatively easy task to include specific performance areas in a definition, developing identification procedures that will enable us to recognize specific areas of superior performance is a more difficult problem. Test developers have thus far devoted most of their energy to the development of measures of general ability, and this emphasis is undoubtedly why these tests are relied on so heavily in identification. However, an operational definition should give direction to needed research and development, especially in the ways that these activities relate to instruments and procedures for student selection. A defensible definition can thus become a model that will generate vast amounts of appropriate research in the years ahead.

A Definition of Gifted Behavior

Although no single statement can effectively integrate the many ramifications of the research studies I have described, the following definition of gifted behavior attempts to summarize the major conclusions and generalizations resulting from this review of research: Gifted behavior consists of behaviors that reflect an interaction among three basic clusters of human traits—these clusters being above average-general and/or specific abilities, high levels of task commitment, and high levels of creativity. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. Children who manifest or are capable of developing an

interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs.

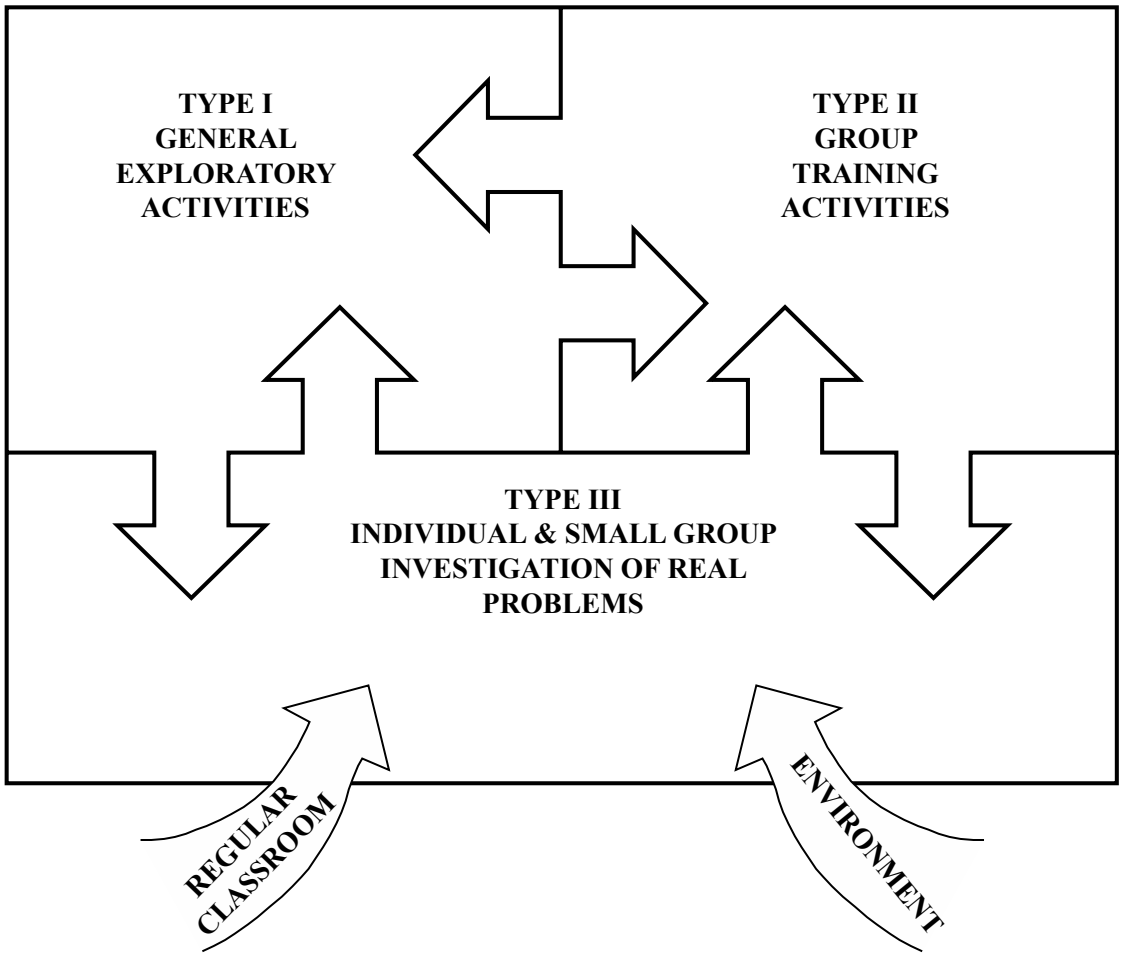

Figure 2. The enrichment triad model.

Summary: What Makes Giftedness?

In recent years we have seen a resurgence of interest in all aspects of the study of giftedness and related efforts to provide special educational services for this often neglected segment of our school population. In this section, I have attempted to provide a framework that draws on the best available research about gifted and talented individuals. I have also reviewed research offered in support of the validity of the three-ring conception of giftedness. This conception and definition have been developed from a decidedly educational perspective because I believe that efforts to define this concept must be relevant to persons who will shoulder the responsibility for developing the gifted behaviors alluded to in the three-ring conception. I also believe that conceptual explanations and definitions must point the way toward practices that are economical, realistic, and defensible in terms of an organized body of underlying research. In Part II of this article, a plan is described that represents a logical and practical programming counterpart to the types of gifted behaviors discussed above.

PART II: THE SCHOOLWIDE ENRICHMENT MODEL

This section describes a plan that has demonstrated its effectiveness in bringing about significant changes in the ways we develop gifts and talents in young people. The plan, entitled the Schoolwide Enrichment Model (SEM), is a systematic set of specific strategies for increasing student effort, enjoyment, and performance, and for integrating a broad range of advanced level learning experiences and higher order thinking skills into any curricular area, course of study, or pattern of school organization. The general approach of the SEM is one of infusing more effective practices into existing school structures rather than layering on additional things for schools to do. This research-supported plan (Renzulli & Reis, 1994) is designed for general education, but it is based on a large number of instructional methods and curricular practices that had their origins in special programs for high ability students.

Research opportunities in a variety of special programs allowed us to develop instructional procedures and programming alternatives that emphasize the need (1) to provide a broad range of advanced level enrichment experiences for *all* students, and (2) to use the many and varied ways that students respond to these experiences as stepping stones for relevant follow up on the parts of individuals or small groups. This approach is not viewed as a new way to identify who is or is not "gifted!" Rather, the process simply identifies how subsequent *opportunities, resources,* and *encouragement* can be provided to support continuous escalations of student involvement in both required and self-selected activities. This approach to the development of high levels of multiple potentials in young people is purposefully designed to sidestep the traditional practice of labeling some students "gifted" (and by implication, relegating all others to the category of not-gifted). The term, "gifted," is used in our lexicon only as an adjective, and even then, it is used in a developmental perspective. Thus, for example, we speak and write about *the development of gifted behaviors* in specific areas of learning and human expression rather than giftedness as a state of being. This orientation has allowed many students opportunities to develop high levels of creative and productive accomplishments that otherwise would have been denied through traditional special program models.

Practices that have been a mainstay of many special programs for "the gifted" are being absorbed into general education by reform models designed to upgrade the performance of all students. This integration of gifted program know-how is viewed as a favorable development for two reasons. First, the adoption of many special program practices is indicative of the viability and usefulness of both the know-how of special programs and the role enrichment specialists can and should play in total school improvement. It is no secret that compensatory education in the United States has largely been a failure! An overemphasis on remedial and mastery models has lowered the challenge level of the very population that programs such as Title I attempts to serve. Second, *all* students should have opportunities to develop higher order thinking skills and to pursue more rigorous content and first-hand investigative activities than those typically found in today's "dumbed down" textbooks. The ways in which students respond to enriched learning experiences should be used as a rationale for providing all students with advanced level follow-up opportunities. This approach reflects a democratic ideal that accommodates the full range of individual differences in the entire student population, and it opens the door to programming models that develop the talent potentials of many at-risk students who traditionally have been excluded from anything but the most basic types of curricular experiences. But to operationalize

this ideal, we need to "get serious" about the things we have learned during the past several years about both programming models and human potential.

The application of gifted program know-how into general education is supported by a wide variety of research on human abilities (Bloom, 1985; Brandwein, 1955, 1981; Gardner, 1983; Renzulli, 1986; Sternberg, 1984). This research clearly and unequivocally provides a justification for much broader conceptions of talent development. These conceptions argue against the restrictive student selection practices that guided identification procedures in the past. Lay persons and professionals at all levels have begun to question the efficacy of programs that rely on narrow definitions, IQ scores, and other cognitive ability measures as the primary method for identifying which students can benefit from differentiated services. Traditional identification procedures have restricted services to small numbers of high scoring students and excluded large numbers of at-risk students whose potentials are manifested in other ways that will be described in a later section that describes an SEM component called the Total Talent Portfolio. Special services should be viewed as opportunities to develop "gifted behaviors" rather than merely finding and certifying them. In this regard, we should judiciously avoid saying that a young person is either "gifted" or "not gifted." Rather, we should describe strengths in specific areas and levels of performance that warrant domain-relevant assessment and special services targeted on the strength area.

The Schoolwide Enrichment Model is based on this kind of behavioral definition of giftedness, and it also advocates applying gifted program know-how to larger segments of the school population. The model is currently being used in hundreds of school districts across the country including major urban areas such as New York City, Detroit, St. Paul, San Antonio, and Fort Worth. The present reform initiatives in general education have created a more receptive atmosphere for more flexible approaches that challenge all students, and accordingly, we have organized the SEM so that it blends into school improvement activities that are currently taking place throughout the country. Space does not permit a detailed description of the full model; however, the following sections will describe the school structures upon which the model is targeted and the three service delivery components. A graphic representation of the model is presented in Figure 3.

School Structures

The Regular Curriculum

The regular curriculum consists of everything that is a part of the predetermined goals, schedules, learning outcomes, and delivery systems of the school. The regular curriculum might be traditional, innovative, or in the process of transition, but its predominant feature is that authoritative forces (i.e., policymakers, school councils, textbook adoption committees, state regulators) have determined that the regular curriculum should be the "centerpiece" of student learning. Application of the SEM influences the regular curriculum in three ways. First, the challenge level of required material is differentiated through processes such as curriculum compacting, textbook content modification procedures, and group jumping strategies. Second, the systematic content intensification procedures used to replace eliminated content with selected, in-depth learning experiences increases the challenge level by introducing the broad underlying principles of a discipline. Third, types of enrichment recommended in the Enrichment

Triad Model (described below) are integrated selectively into regular curriculum activities. Although our goal in the SEM is to influence rather than replace the regular curriculum, application of certain SEM components and related staff development activities have resulted in substantial changes in both the content and instructional processes of the entire regular curriculum.

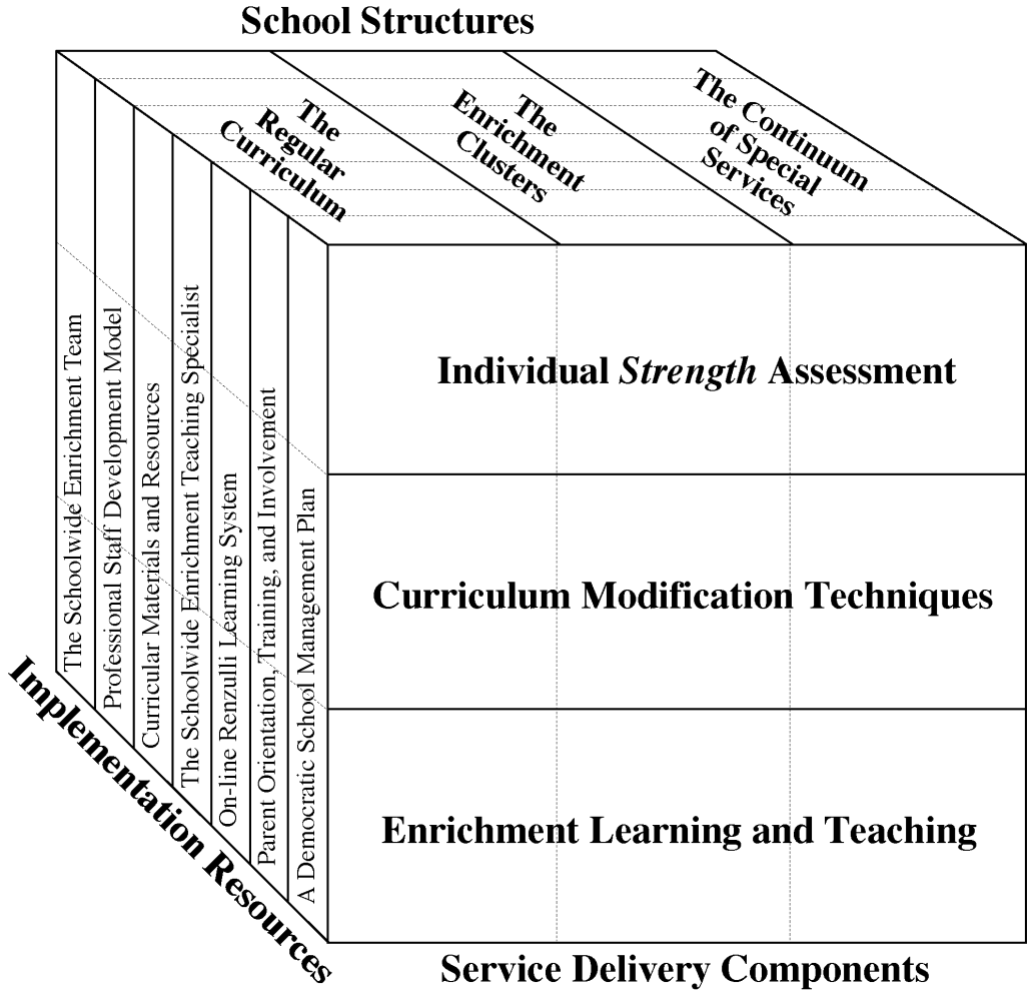

Figure 3. The schoolwide enrichment model.

The Enrichment Clusters

The enrichment clusters are non-graded groups of students who share common interests, and who come together during specially designated time blocks to pursue these interests. Like extracurricular activities and programs such as 4-H and Junior Achievement, the main rationale for participation in one or more clusters is that *students and teachers want to be there.* All teachers (including music, art, physical education, etc.) are involved in teaching the clusters; and teacher involvement in any particular cluster is based on the same type of interest assessment used for students. Community resource persons should also be invited to organize enrichment clusters. The model for learning used with enrichment clusters is based on an inductive approach to the pursuit of real-world problems rather than traditional, didactic modes of teaching. This

approach, entitled enrichment learning and teaching, is purposefully designed to create a learning environment that places a premium on the development of higher order thinking skills and the authentic application of these skills in creative and productive situations. The theory underlying this approach is based on the work of constructivist theorists such as Jean Piaget, Jerome Bruner, and John Dewey, and applications of constructivist theory to classroom practice. Enrichment clusters are excellent vehicles for promoting cooperativeness within the context of real-world problem solving, and they also provide superlative opportunities for promoting self-concept. A major assumption underlying the use of enrichment clusters is that every child is special if we create conditions in which that child can be a specialist within a specialty group.

Enrichment clusters are organized around major disciplines, interdisciplinary themes, or cross-disciplinary topics (e.g., an electronic music group or a theatrical/television production group that includes actors, writers, technical specialists, costume designers, etc.). The clusters are modeled after the ways in which knowledge utilization, thinking skills, and interpersonal relations take place in the real world. Thus, all work is directed toward the production of a product or service. There are no lesson plans or unit plans. Rather, direction is provided by the following six key questions:

1. What do people with an interest in this area do?
2. What products do they create and/or what services do they provide?
3. What methods do they use to carry out their work?
4. What resources and materials are needed to produce high quality products and services?
5. How, and with whom, do they communicate the results of their work?
6. What steps need to be taken to have an impact on intended audiences?

The enrichment clusters are not intended to be the total program for talent development in a school, but they are a major vehicle for stimulating interests and developing talent potentials across the entire school population. They are also vehicles for staff development in that they provide teachers an opportunity to participate in enrichment teaching, and subsequently to analyze and compare this type of teaching with traditional methods of instruction. In this regard the model promotes a spill-over effect by encouraging teachers to become better talent scouts and talent developers, and to apply enrichment techniques to regular classroom situations.

The Continuum of Special Services

A broad range of special services is the third school structure that is targeted by the model. These services typically include individual or small group counseling, direct assistance in facilitating advanced-level work, arranging for mentorships with faculty members or community persons, and making other types of connections between students, their families, and out-of-school persons, resources, and agencies. Direct assistance also involves setting up and promoting student, faculty and parental involvement in special programs such as Future Problem Solving, Odyssey of the Mind, the Model United Nations program, and state and national science, essay, mathematics, and history competitions. Another type of direct assistance consists of arranging out-of-school involvement for individual students in summer programs, on-campus courses, special schools, theatrical groups, scientific expeditions, and apprenticeships at places where advanced level learning opportunities are available. Provision of these services is one of the

responsibilities of the schoolwide enrichment teaching specialist or an enrichment team of teachers and parents who work together to provide options for advanced learning.

Service Delivery Components

The Total Talent Portfolio

Our approach to targeting learning characteristics uses both traditional and performance-based assessment to compile information about three dimensions of the learner—abilities, interests, and learning styles. This information, which focuses on strengths rather than deficits, is compiled in a folder called the Total Talent Portfolio, and it is used to make decisions about talent development opportunities in regular classes, enrichment clusters, and in the continuum of special services. Two questions summarize the intent of the Total Talent Portfolio: (1) What are the very best things we know and can record about a student's best work? and (2) what are the best ways we can utilize the information to nurture the student's talent? This expanded approach to identifying talent potentials is essential if we are to make genuine efforts to include more underrepresented students in a plan for *total* talent development. This approach is also consistent with the more flexible conception of *developing* gifts and talents that has been a cornerstone of our work and our concerns for promoting more equity in special programs.

Curriculum Modification Techniques

The second service delivery component of the SEM is a series of curriculum modification techniques that are designed to (1) adjust levels of required learning so that all students are challenged, (2) increase the number of in-depth learning experiences, and (3) introduce various types of enrichment into regular curricular experiences. The procedures used to carry out curriculum modification are curriculum compacting, textbook analysis and surgical removal of repetitious material from textbooks, and a planned approach for introducing greater depth into regular curricular material.

Curriculum compacting (Reis & Renzulli, 1992) is a systematic procedure for modifying or streamlining the regular curriculum in order to eliminate repetition of previously mastered material, upgrading the challenge level of the regular curriculum, and providing time for appropriate enrichment and/or acceleration activities. This process includes (1) defining the goals and outcomes of a particular unit or segment of instruction, (2) determining and documenting which students have already mastered most or all of a specified set of learning outcomes, or who are capable of mastering them in less time than their peers, and (3) providing replacement activities for material already mastered through the use of instructional options that enable a more challenging and productive use of the student's time. These options include content acceleration, individual or group research projects, peer teaching, and involvement in non-classroom activities discussed in the section on the continuum of services. A key feature of these options is that students have some freedom to make decisions about the topic and the methods through which the topic will be pursued. Curriculum compacting might best be thought of as *organized common sense,* because it simply recommends the natural pattern that teachers ordinarily follow when individualizing instruction or teaching in the days before textbooks were "invented." Compacting might also be thought of as the "mirror image" of remedial procedures that have always been used in diagnostic/prescriptive models of teaching.

The second procedure for making adjustments in regular curricular material is the examination of textbooks in order to determine which parts can be economized upon through textbook analysis and "surgical" removal of repetitious drill and practice. The textbook *is* the curriculum in the overwhelming majority of today's classrooms; despite all of the rhetoric about school and curriculum reform, this situation is not likely to change in the near future. Until such time that high-quality textbooks are universally available, it is essential to deal with the curriculum situation as it currently exists. Although curriculum compacting is one procedure that can be used to get an unchallenging curriculum "off the backs" of students who are in need of curriculum modifications, the procedure is a form of "damage control." Therefore, we need to take a more proactive stance to overcome the well-documented low levels of American textbooks. The procedures for carrying out the textbook analysis and surgical removal process are based on the argument that "less is better" when it comes to content selection, and it is necessary to make wise decisions when determining which material will be covered in greater depth.

Enrichment Learning and Teaching

The third service delivery component of the SEM is enrichment learning and teaching. Enrichment learning and teaching is based on the ideas of a small but influential number of philosophers, theorists, and researchers.[5] The work of these theorists, coupled with our own research and program development activities, has given rise to the concept we call enrichment learning and teaching. The best way to define this concept is in terms of the following four principles:

1. Each learner is unique, and therefore all learning experiences must be examined in ways that take into account the abilities, interests, and learning styles of the individual.
2. Learning is more effective when students enjoy what they are doing, and therefore learning experiences should be constructed and assessed with as much concern for enjoyment as for other goals.
3. Learning is more meaningful and enjoyable when content (i.e., knowledge) and process (i.e., thinking skills, methods of inquiry) are learned within the context of a real and present problem; therefore, attention should be given to opportunities to personalize student choice in problem selection, the relevance of the problem for individual students at the time the problem is being addressed, and authentic strategies for addressing the problem.
4. Some formal instruction may be used in enrichment learning and teaching, but a major goal of this approach to learning is to enhance knowledge and thinking skill acquisition that is gained through formal instruction with applications of knowledge and skills that result from students' own construction of meaning.

The ultimate goal of learning that is guided by these principles is to replace dependent and passive learning with independence and engaged learning. Although all but the most

[5] Although it is beyond the scope of this article to review the work of these eminent thinkers, the group includes William James, Alfred North Whitehead, John Dewey, Maria Montessori, Jean Piaget, Paul Torrance, Paul F-Brandwein, Jerome Bruner, Philip Phenix, Howard Gardner, Robert Sternberg, and Albert Bandura.

conservative educators will agree with these principles, much controversy exists about how these (or similar) principles might be applied in everyday school situations. A danger also exists that these principles might be viewed as yet another idealized list of glittering generalities that cannot be manifested easily in schools which are entrenched in the deductive model of learning. Developing a school program based on these principles is not an easy task. Over the years, however, we have achieved a fair amount of success by gaining faculty, administrative, and parental consensus on a small number of easy-to-understand concepts and related services, and by providing resources and training related to each concept and service delivery procedure. Numerous research studies (summarized in Renzulli & Reis, 1994) and field tests in schools with widely varying demographics have been conducted. These studies and field tests have provided opportunities for the development of large amounts of practical know-how that are readily available for schools that would like to implement the SEM.

The Enrichment Triad Model

For enrichment learning and teaching to be systematically applied to the learning process, it must be organized in a way that makes sense to teachers and students. An organizational pattern called the Enrichment Triad Model (Renzulli, 1977) is used for this purpose. The three types of enrichment in the model are depicted in Figure 2. Before discussing the role and function of each type of enrichment, it is necessary to discuss three considerations that relate to the model in general.

Learning in a Natural Way

The Enrichment Triad Model is based on the ways in which people learn in a natural environment rather than the artificially structured environment that characterizes most classrooms. Just as scientists "look to nature" when they attempt to solve particular types of problems, the process of learning is examined as it unfolds in the non-school world. This process is elegant in its simplicity! External stimulation, internal curiosity, necessity, or combinations of these three starting points cause people to develop an interest in a topic, problem, or area of study. Humans are, by nature, curious, problem-solving beings; but for them to act on a problem or interest with some degree of commitment and enthusiasm, the interest must be a sincere one and one in which they see a personal reason for taking action. Once the problem or interest is personalized, a need is created to gather information, resources, and strategies for acting upon the problem.

Problem solving in nature almost always results in a product or service that has a functional, artistic, or humanitarian value. The learning that takes place in real-problem situations is *collateral learning* that results from attacking the problem to produce a product or service. It was precisely this kind of natural problem solving situation that gave rise to the Enrichment Triad Model. The only difference between the natural learning that takes place in real life situations and the use of the Triad Model within the more structured world of the school is that we view products as vehicles through which a wide variety of more enduring and transferable processes can be developed. Learning that focuses on the interaction between product and process results in the kinds of learning experiences that enhance both the present and the future.

More Than a Sum of the Parts

A second general consideration about the Enrichment Triad Model is that the *interaction* between and among the three types of enrichment is as important as any type of enrichment or the collective sum of all three types. In other words, the arrows in Figure 2 are as important as the individual cells, because they give the model dynamic properties that cannot be achieved if the three types of enrichment are pursued independently. A Type I experience, for example, may have value in and of itself, but it achieves maximum payoff if it leads to Type II or III experiences. In this regard, it is a good idea to view Types I and II enrichment as "identification situations" that may lead to Type III experiences, which are the most advanced type of enrichment in the model. As Figure 2 indicates, the regular curriculum and the environment in general (i.e., non-school experiences) can also serve as pathways of entry into Type III activities. An identification situation is simply an experience that allows students and teachers an opportunity to (1) participate in an activity, (2) analyze their interest in and reaction to the topic covered in the activity and the processes through which the activity was pursued, and (3) make a purposeful decision about their interest in the topic and the diverse ways further involvement may be carried out. Type I and Type II are general forms of enrichment that are usually pursued with larger groups of students. Type III Enrichment, on the other hand, is pursued only on a voluntary and self-selected basis.

The interactiveness of the three types of enrichment also includes what are sometimes called the "backward arrows" in Figure 2 (e.g., the arrows leading back from Type III to Type I, etc.). In many cases, the advanced work of students (i.e., Type III) can be used as Type I and II experiences for other students. Thus, for example, a group of students who carried out a comprehensive study on lunchroom waste presented their work to other groups for both awareness and instructional purposes, and for purpose of stimulating potential new interests on the part of other students. In this regard, the model is designed to renew itself and to bring students "inside" the pedagogy of the school enterprise rather than viewing learning from a spectator's perspective.

Personal Knowledge

A third consideration about the Enrichment Triad Model in general is that it is designed to help students gain personal knowledge about their own abilities, interests, and learning styles. If, as Socrates said, "The unexamined life is not worth living," then we should also consider a corollary to this axiom about life in school: "The unexamined lesson is not worth learning!" Although it would be desirable to apply this corollary to all school experiences, the types of enrichment advocated in the Triad Model are excellent vehicles for examining preferences, tastes, and inclinations that will help students gain a greater understanding of themselves.

This corollary is operationalized in the model by recommending debriefings and post-learning analyses (sometimes called meta-learning) about both *what* has been learned, and *how* a particular segment of learning has been pursued. Following exposure to a particular instructional style, a careful post-learning analysis should be conducted that focuses on the unique properties of the purposefully selected instructional technique. Students should be encouraged to discuss and record in personal journals their reactions to the instructional technique in terms of both efficiency in learning and the amount of pleasure they derive from the technique. The goal of the

post-learning analysis is to help students understand more about themselves by understanding more about their preferences in a particular situation. Thus, the collective experiences in learning styles should provide (1) exposure to many styles, (2) an understanding of which styles are the most personally applicable to particular subjects, and (3) experience in how to blend styles in order to maximize both the effectiveness and satisfaction of learning.

In the sections that follow, a brief description of each component of the Triad Model will be presented. It will be helpful to keep in mind that the Triad Model is part of the service delivery component that is targeted on three school structures: the regular curriculum, the enrichment clusters, and the continuum of special services. In many ways, enrichment learning and teaching can be thought of as an overlay which can be applied to these three school structures.

Type I Enrichment: General Exploratory Experiences. Type I Enrichment consists of general exploratory experiences that are designed to expose students to new and exciting topics, ideas, and fields of knowledge not ordinarily covered in the regular curriculum. This type of enrichment is carried out through a variety of procedures such as visiting speakers, demonstrations, mini visits, video presentations, interest centers, and the use of other audiovisual and technological materials. Type I Enrichment and the debriefing which accompanies this type of enrichment represents an invitation to more advanced levels of involvement with the topic or area of interest.

Type II Enrichment: Group Training Activities. Type II Enrichment consists of methods, materials, and instructional techniques that are designed to develop higher level thinking processes, research and reference skills, and processes related to personal and social development. Type II Enrichment is provided for all students within the regular curriculum, as well as students who are involved in enrichment clusters and self-selected, independent investigations. For example, students in a science class who are involved with determining water quality of a local river above and below the location of a major industrial park may need training in hypothesizing, data analysis, and research report writing. This training serves as motivation to participate in a self-selected independent investigation. A small group of students engaged in a real-world investigation related to oral history may need training on interview protocol, the use of tape recorder devices, and data analysis.

Type III Enrichment: Individual and Small Group Investigations of Real Problems. Type III Enrichment is the highest level of enrichment in which students can engage because they exchange their role from traditional lesson learner to first-hand inquirer. Type III Enrichment is distinguished from other types of enrichment by five essential elements: (1) a personal frame of reference, (2) a focus on advanced-level knowledge, (3) a focus on methodology, (4) a sense of audience, and (5) authentic evaluation.

First, a Type III Enrichment experience must be based on the interest of the individual or small group of students; students must “own” the real problem they will investigate. Second, this type of enrichment requires that students draw upon the roles and skills of practicing professionals. These skills include, for example, judging problem difficulty, apportioning time and predicting outcomes. Third, Type III Enrichment requires that students utilize authentic methodology. Students involved in a scientific investigation will employ the scientific method;

students involved in video production will use the methodology of media experts in the field. A sense of audience is the fourth essential element in Type III Enrichment. It is the real audience that encourages students to improve the quality of their product and develop new and effective ways of communicating their findings. Finally, Type III Enrichment is characterized by authentic evaluation. Type III projects are products produced using the methodology of a field; by necessity the products must be evaluated according to criteria provided by experts in the field and whether or not the product has the desired impact on the intended audience.

Schoolwide Enrichment and Educational Reform

Most efforts to make major changes in schooling have failed. Although there is endless speculation about why schools are so resistant to change, most theorists and policymakers have concluded that tinkering with single components of a complex system will give only the appearance of school improvement rather than the real and lasting change so desperately sought by educational leaders. Examples of single-component tinkering are familiar to most educators. More rigorous curriculum standards, for example, without improved curricular materials and teachers able to use the materials effectively negates any potential value that new standards may have for improving academic performance. Similarly, single-component tinkering designed to force change in classrooms (e.g., high-stakes testing) may create the illusion of improved achievement, but the reality is increased pressure on schools to expand the use of compensatory learning models that, so far, have contributed only to the "dumbing down" of curriculum and the lowering of academic standards. Teacher empowerment, school-based management, an extended school day and year, and revised teacher certification requirements are merely apparitions of change when state or central office regulations prescribe the curriculum by using tests that will determine whether schools get high marks for better performance.

How, then, do we establish an effective change process—one that overcomes the long record of failed attempts? The leverage for meaningful change depends on breaking two mindsets: (1) that one person or single group knows the right answer, and (2) that change is linear. The only reasonable solution is to develop a process whereby the adoption of policy and the adoption of practice proceed simultaneously! Policymakers and practitioners in schools need to collaborate during all phases of the change process by examining local capacity and motivation in conjunction with the desired changes. Thus, neither policymakers nor practitioners, by themselves, can reform schools; instead both must come together to shape a vision and develop the procedures that will be needed to realize and sustain that vision. Senge (1990) compares "visioneering" to the hologram, a three-dimensional image created by interacting light sources:

> When a group of people come to share a vision, . . . each sees his or her own picture. Each vision represents the whole image from a different point of view. When you add up the pieces of the hologram, the image does not change fundamentally, but rather becomes more intense, more lifelike, more real in the sense that people can truly imagine achieving it. The vision no longer rests on the shoulders of one person [or one group], but is shared and embodies the passion and commitment of all participants. (Senge, 1990, p. 312)

The books on which this summary of the model is based (Renzulli, 1977; Renzulli & Reis, 1994, 1997) have been developed around a shared vision that my colleagues in The Neag Center for Gifted Education and Talent Development at the University of Connecticut and I have had for a number of years. This vision is also embraced by thousands of teachers and administrators with whom we have worked in academic programs and summer institutes that date back to the 1970s. Simply stated, this vision is that schools are places for talent development. Academic achievement is an important part of the vision and the SEM plan for school improvement; however, we also believe a focus on talent development places the need for improved academic achievement into a larger perspective about the goals of education. The things that have made our nation great and our society one of the most productive in the world are manifestations of talent development at all levels of human productivity. From the creators and inventors of new ideas, products, and art forms, to the vast array of people who manufacture, advertise, and market the creations that improve and enrich our lives, there are levels of excellence and quality that contribute to our standard of living and way of life.

This vision of schools for talent development is based on the belief that *everyone* has an important role to play in societal improvement, and that everyone's role can be enhanced if we provide all students with opportunities, resources, and encouragement to aspire to the highest level of talent development humanly possible. Rewarding lives are a function of ways we use individual potentials in productive ways. Accordingly, the SEM is a practical plan for making our vision of schools for talent development a reality. We are not naive about the politics, personalities, and financial issues that often supersede the pedagogical goals that are the focus of this our work. At the same time, we have seen this vision manifested in schools ranging from hard core urban areas and isolated and frequently poor rural areas to affluent suburbs and combinations thereof. We believe that the strategies used in this model provide the guidance for making any school a place for talent development.

There are no quick fixes or easy formulas for transforming schools into places where talent development is valued and vigorously pursued. Our experience has shown, however, that once the concept of talent development catches on, students, parents, teachers, and administrators begin to view their school in a different way. Students become more excited and engaged in what they are learning; parents find more opportunities to become involved in all aspects related to their children's learning, rather than "around the edges" activities; teachers begin to find and use a variety of resources that, until now, seldom found their way into classrooms; and administrators start to make decisions that affect learning rather than "tight ship" efficiency.

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